

Claims

1. Method for transport of toner material, preferably in an electrophotographic printer or copier,

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in which toner material (12) is transported from a reservoir (16, 28) with the aid of a toner transport system (10) of the printer or copier,

10 at least the toner material quantity (12) extracted from the reservoir (16, 28) is detected,

the detected toner material quantity (12) is associated with the reservoir (16, 28) from which the toner material (12) is extracted.

15 2. Method according to claim 1, characterized in that the toner material (12) is transported from the reservoir (16, 28) into a buffer (28, 14).

20 3. Method according to claim 2, characterized in that the toner material (12) is transported from the reservoir (16, 28) into a developer station (14) of the printer or copier.

25 4. Method according to claim 2 or 3, characterized in that a preset quantity of temperature measurement event (12) is transported from the reservoir (16, 28) into the developer station (14) after the under-run of a minimum quantity of toner material (12) in the developer station (14).

30 5. Method according to claim 4, characterized in that the preset quantity is established via the control of the transport duration (t1, t2), whereby the transport capacity is essentially constant.

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6. Method according to claim 5, characterized in that the transport duration (t1, t2) is hard-set for a transport action in the printer or copier.
7. Method according to claim 6, characterized in that the number (D) of the transport actions per reservoir (16, 28) is detected.
- 5 8. Method according to any of the preceding claims, characterized in that the toner material (12) is transported with the aid of a preset negative pressure.
- 10 9. Method according to any of the claims 4 through 8, characterized in that, at least in one region, the preset quantity of toner material (12) is transported with the aid of a paddlewheel and/or a transport spindle (34, 38) from the reservoir (16, 28) into the developer station (14), whereby the transported quantity is determined with the aid of the rotations of the paddlewheel or, 15 respectively, of the transport spindle (34, 38).
10. Method according to claim 9, characterized in that the number of the rotations for a transport action is hard-set in the printer or copier.
- 20 11. Method according to claim 10, characterized in that the number of the rotations per transport action is controlled with the aid of the transport duration given an essentially constant drive rotation speed of the paddlewheel or, respectively, of the transport spindle (34, 38).
- 25 12. Method according to claim 11, characterized in that the number (D) of the transport actions is detected per reservoir (16, 28).
13. Method according to any of the preceding claims, characterized in that at 30 least one further transport action is implemented when the minimum quantity of temperature measurement event (12) in the developer station (14) is not achieved or exceeded after a transport action.

14. Method according to claim 7 or 12, characterized in that the transport actions (D) associated with the reservoir (16, 28) is [sic] associated with a limit value (K2), whereby upon reaching and/or exceeding the limit value (K2) the reservoir (16, 28) is identified as empty.

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15. Method according to claim 14, characterized in that state information that specifies whether toner material (12) is present in the reservoir (16, 28) is stored in a storage range (60) associated with the reservoir (16, 28).

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16. Method according to claim 14 or 15, characterized in that the number (D) of transport actions associated with the reservoir (16, 28) is only then compared with a limit value (K2) after the minimum quantity of toner material (12) in the developer station (14) has not been reached after a preset number (K1) of successively implemented transport actions.

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17. Method according to claim 15 or 16, characterized in that no toner material (12) is transported from the reservoir (16, 28) when the state information specifies that toner material (12) is no longer contained in the reservoir (16, 28).

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18. Method according to any of the preceding claims, characterized in that the reservoir (16, 28) is a transport reservoir (16) or a buffer (28).

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19. Arrangement for transport of toner material in an electrophotographic printer or copier,

with a toner transport system (10) that transports toner material (12) from a reservoir (16, 28),

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with a device for detection of the toner material quantity extracted from the reservoir (16, 28),

5 whereby the detected toner material quantity can be associated with the reservoir (16, 28) from which the toner material (12) is extracted.

20. Arrangement according to claim 19, characterized in that the reservoir (16, 28) is a transport reservoir (16) that contains an information medium (60) on which at least the total number (D) of the transport actions associated 10 with the transport reservoir (16) and/or the possible number of transport actions is applied as a limit value (K2) in a machine-readable format.
21. Method for transport of toner material in an electrophotographic printer or copier,  
15 in which toner material (12) is transported from a reservoir (28) into the developer station (14) after the under-run of a lower first limit value of a first toner material quantity present in a developer station (14),  
20 toner material (12) is transported from a transport reservoir (16) into the reservoir (28) after the under-run of a lower second limit value of a second toner material quantity present in the reservoir (28),  
25 at least the toner material quantity transported from the reservoir (16) to the developer station (14) is detected,  
30 the detected toner material quantity is associated with the transport reservoir (16) from which the toner material (12) is extracted after the under-run of the second limit value, whereby the total quantity (D) extracted from the transport reservoir (16) is determined.

22. Method according to claim 21, characterized in that, after the under-run of the second limit value, toner material (12) is transported from the transport reservoir (16) into the reservoir (28) at least until the second limit value is reached and/or exceeded.

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23. Method according to claim 21 or 22, characterized in that, after the under-run of the second limit value, toner material (12) is transported from the transport reservoir (16) into the reservoir (28) until an upper third limit value is reached and/or exceeded.

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24. Method according to any of the claims 21 through 23, characterized in that the determined total quantity (D) is compared with a fourth limit value associated with the transport reservoir (16), whereby the transport reservoir (16) is identified as empty upon reaching and/or exceeding the fourth limit value (K2).

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25. Method according to claim 24, characterized in that state information that specifies whether the transport reservoir is empty is stored in a storage range associated with the transport reservoir (16).

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26. Method according to claim 24 or 25, characterized in that the determined total quantity (D) is only then compared with the fourth limit value (K2) after the third limit value has not been reached after a preset transport time and/or after a preset number of transport actions.

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27. Method according to any of the claims 21 through 26, characterized in that the preset transport time is determined from the number of transport actions with preset duration.

30 28. Method according to any of the claims 21 through 27, characterized in that the first toner material quantity is determined with the aid of the toner

concentration of the toner material-carrier particle mixture present in the developer station (14), whereby the first limit value is the minimum toner concentration of the toner material-carrier particle mixture.

5 29. Arrangement for transport of toner material in an electrophotographic printer or copier,

with a first transport device that transports toner material (12) from a reservoir (28) into the developer station (14) after the under-run of a lower 10 first limit value of a first toner material quantity present in a developer station (14),

15 with a second transport device that transports toner material (12) from a transport reservoir (16) into the reservoir (16) after the under-run of a lower second limit value of a second toner material quantity present in the reservoir (28),

20 with a device to at least detect the toner material quantity transported from the reservoir (28) to the developer station (14),

[sic] the detected toner material quantity can be associated with the transport reservoir (16) from which the toner material (12) is extracted after the under-run of the second limit value.

25 30. Arrangement according to claim 29, characterized in that the transport reservoir (16) comprises an information medium (60) on which at least the total number (D) of the transport actions associated with the transport reservoir (16) and/or the possible number of transport actions is applied as a limit value (K2) in a machine-readable format.